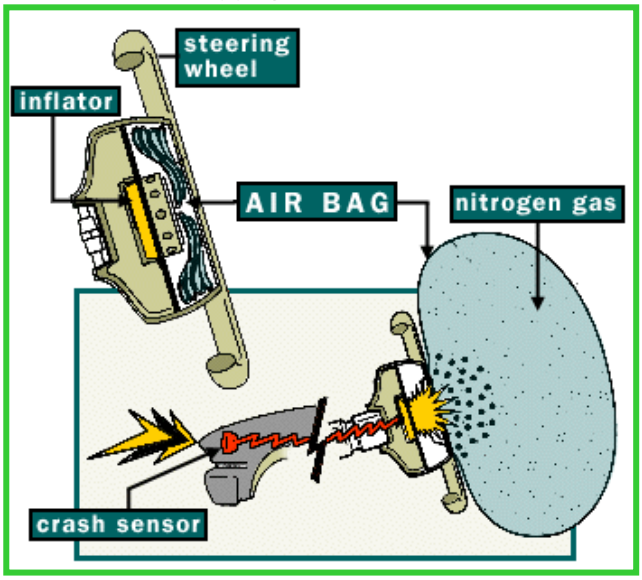
SHOPTALK

Vehicle Occupant Protection Air Bags Behave Unexpectedly

What Happened?

- MSFC recently experienced 2 incidents in which vehicle air bags (technically called "supplemental restraint systems" or "SRS") did not perform as the drivers expected them to:
  - When the ignition key was turned to start a vehicle, the driver's side air bag deployed.
  - When a car entered an intersection after stopping at a stop sign, it struck the driver's side door of a car occupying the intersection; neither vehicle's air bags deployed.



From: http://whyfiles.org/032air_bag/how_work.html

How Front Air Bag Systems Work

- A car hits something in front, losing speed fast enough to trigger the air bag crash sensors.
- Sensors measure the rate at which the vehicle slows down. Sensor trigger points are set for a frontal, or near frontal, collision force equal to hitting a solid barrier at about 8 to 14 miles per hour.
- The sensor turns a switch, & electric current moves through the wire heating element in the inflator.
- The heated wire activates the propellant in the inflator (sodium azide reacts with potassium nitrate), producing nitrogen gas that inflates the air bag in 1/25 of a second.
- The nitrogen gas cools rapidly, escapes through pores in the air bag, & deflates the air bag.
- The diagnostic module monitors system conditions, controls the dashboard warning light, stores diagnostic information codes, & supplies backup electrical current to activate the system if battery power is lost. Newer vehicles use 'smart' or 'advanced' systems where computer capability lets the module operate as a control module, using logic functions to determine how the air bags should be deployed.

Good Things To Know

- Diagnostic & control modules self-test the air bag system each time the vehicle ignition is turned on. A warning light is activated if any problem is identified. Take the vehicle to an authorized air bag service provider if this happens, or if the warning light comes on during normal vehicle operation.
- The nature of the crash determines if & when sensors are triggered, because the trigger point is based on how quickly the vehicle loses speed. Travel speed & vehicle damage are not reliable indicators of whether or not air bags should have deployed during a crash.
- Front air bags will not deploy in crashes involving side or rear impact, or rollovers. Front impacts that occur at an angle may be outside the sensor's trigger point setting, so air bags will not deploy. Air bags deploy only once, & cannot protect against multiple collisions during an accident.
- Seat belt use is necessary to avoid injury when air bags deploy, & to protect occupants during collisions when air bags do not deploy. Keep at least 10 inches between your chest & the air bag unit. Children under 12 should always occupy the rear seat & use seat belt restraint systems.

Find More Detailed Information

- http://www.nhtsa.dot.gov/people/injury/airbags/airbags03/index.html
- http://www.actsinc.org/publications_1.cfm
- http://auto.howstuffworks.com/airbag1.htm
- http://www.pueblo.gsa.gov/cic_text/cars/airbags/brochure.html

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